

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-449
Relating to Exemptions Under Section 27156
of the Vehicle Code

THE BRAUN CORPORATION
20-GALLON POLYETHYLENE PLASTIC
REPLACEMENT FUEL TANK ASSEMBLY
PART NO. 51907A-9606

Pursuant to the authority vested in the Air Resources Board (ARB) by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: That the installation of The Braun Corporation's (Braun's) 20-gallon polyethylene plastic replacement fuel tank assembly, part no. 51907A-9606, manufactured for Braun (631 West 11th Street, Winamac, Indiana 46996) by Meese Orbitron Dunne Company of 4920 State Road, P.O. Box 607, Ashtabula, Ohio 44004, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the replacement fuel tank assembly is exempt from the prohibitions of Section 27156 of the California Vehicle Code for installation on 1997 and 1998 model-year Chrysler Corporation 3.3 and 3.8 liter Dodge Caravans, originally equipped with 20-gallon polyethylene plastic fuel tanks.

This Executive Order is valid provided that installation instructions for the replacement fuel tank assembly not recommend tuning the vehicles to specifications different from those submitted by the vehicle manufacturer.

Changes made to the design or operating conditions of the replacement fuel tank assembly, as exempt by the ARB, which may adversely affect the performance of a vehicle's pollution control system, shall invalidate this Executive Order.

Marketing of the replacement fuel tank assembly using an identification other than that shown in this Executive Order or for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the ARB. Exemption of the replacement fuel tank assembly shall not be construed as an exemption to sell, offer for sale, or advertise any components of the replacement fuel tank assembly as individual devices.

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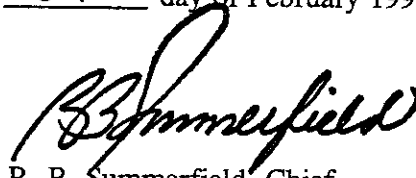
This Executive Order does not constitute any opinion as to the effect the use of the replacement fuel tank assembly may have on any warranty either expressed or implied by the vehicle manufacturer.

No claim of any kind, such as "Approved by the Air Resources Board," may be made with respect to the action taken herein in any advertising or other oral or written communication.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE BRAUN CORPORATION'S 20-GALLON POLYETHYLENE PLASTIC REPLACEMENT FUEL TANK ASSEMBLY.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order. The Executive Order may be revoked only after a ten-day written notice of intention to revoke the Executive Order, in which period the holder of the Executive Order may request in writing a hearing to contest the proposed revocation. If a hearing is requested, it shall be held within ten days of receipt of the request and the Executive Order may not be revoked until a determination after the hearing that grounds for revocation exist.

Executed at El Monte, California, this 24th day of February 1998.



R. B. Summerfield, Chief
Mobile Source Operations Division

State of California
AIR RESOURCES BOARD

EVALUATION OF THE BRAUN CORPORATION'S
20-GALLON POLYETHYLENE PLASTIC REPLACEMENT FUEL TANK ASSEMBLY
FOR EXEMPTION FROM THE PROHIBITIONS OF VEHICLE CODE
SECTION 27156 IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE
CALIFORNIA CODE OF REGULATIONS

February 1998

State of California
AIR RESOURCES BOARD

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by

Mobile Source Operations Division

State of California
Air Resources Board
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(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.)

SUMMARY

The Braun Corporation (Braun) of 631 West 11th Street, Winamac, Indiana 46996 has applied for an exemption from the prohibitions of Section 27156 of the California Vehicle Code for their replacement fuel tank assembly, part no. 51907A-9606. Braun's 20-gallon polyethylene plastic fuel tank has been designed to replace the original equipment manufacturer 20-gallon polyethylene plastic midship fuel tanks used on 1997 and 1998 model-year Chrysler Corporation 3.3 and 3.8 liter Dodge Caravans.

Based on the test data submitted by Braun, staff concludes that Braun's replacement fuel tank assembly will not adversely affect the evaporative emissions or the on-board diagnostic monitoring systems of the vehicles for which the exemption is requested. This vehicle application includes those vehicles that have been certified to enhanced evaporative emission standards and equipped with on-board evaporative system leak detection system.

Staff recommends that Braun be granted an exemption for their replacement fuel tank assembly, part no. 51907A-9606, as requested and that Executive Order No. D-449 be issued.

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I. INTRODUCTION

The Braun Corporation (Braun) of 631 West 11th Street, Winamac, Indiana 46996 has applied for an exemption from the prohibitions of Section 27156 of the California Vehicle Code for their replacement fuel tank assembly, part no. 51907A-9606, for installation on 1997 and 1998 model-year Chrysler Corporation 3.3 and 3.8 liter Dodge Caravans. Braun has submitted all the required information including drawings and installation instructions for their replacement fuel tank. Braun has also submitted fuel tank temperature comparison test data and on-board diagnostic (OBD II) system test results for evaluation.

II. CONCLUSION

Based on the test data submitted by Braun, staff concludes that Braun's replacement fuel tank will not adversely affect the evaporative emissions or the OBD II monitoring systems of the 1997 and 1998 model-year 3.3 and 3.8 liter Dodge Caravans.

III. RECOMMENDATION

Staff recommends that Braun be granted an exemption as requested, permitting advertisement, sale and installation of their 20-gallon polyethylene plastic fuel tank assembly, part

no. 51907A-9606, on 1997 and 1998 model-year Chrysler Corporation 3.3 and 3.8 liter Dodge Caravans, originally equipped with 20-gallon polyethylene plastic fuel tanks.

IV. DEVICE DESCRIPTION AND OPERATION

Braun has designed their fuel tank to facilitate replacement of the original equipment manufacturer (OEM) fuel tanks on 1997 and 1998 model-year Chrysler Corporation 3.3 and 3.8 liter Dodge Caravans. The replacement fuel tank will be manufactured by Meese Orbitron Dunne Company of 4920 State Road, P.O. Box 607, Ashtabula, Ohio 44004. The assembly consists of a 20-gallon CL-200 Crosslinkable polyethylene plastic fuel tank, OEM-specification fuel and vapor lines, mounting straps and brackets, and various fittings. Braun's fuel tank replaces the 20-gallon midship OEM fuel tank made of high density polyethylene plastic. The replacement fuel tank is installed aft-of-axle with the use of longer replacement fuel and vapor lines. The OEM fuel pump, fuel level sensor, rollover valve, filler cap, and emission canister are all retained. The emission canister is relocated, 78 inches, from the front, driver side of the vehicle to the rear, passenger side of the vehicle; however, with the relocation of the fuel tank, the distance between the fuel tank and the emission canister remains the same. All other OEM exhaust and evaporative emission control systems are retained without modification.

V. DEVICE EVALUATION AND DISCUSSION

The vehicles for which Braun is requesting exemption have been certified to meet the enhanced evaporative emission standards. In order to demonstrate that their replacement fuel tank does not adversely affect the vehicle's evaporative emissions, Braun conducted testing on a 1998 model-year 3.3 liter Dodge Grand Caravan SE equipped with engine family WCRXT0201230 and

evaporative family WCRXE0101G2A. The testing was conducted at Automotive Testing Laboratories, Inc. (ATL) in Mesa, Arizona and consisted of measuring and comparing liquid fuel and vapor space temperatures in the OEM and replacement fuel tanks.

For each test, the fuel tank was filled to 40 percent capacity with California Phase II test fuel, and the vehicle was soaked overnight at 75°F. Following the cold soak, the vehicle was operated over the CVS-75 Federal Test Procedure for preconditioning, then the liquid fuel temperature was stabilized at 105°F. Using thermocouples (two for liquid fuel and one for vapor space), the temperature in the fuel tank was measured while the vehicle was operated over the running loss test cycle, specifically, one Urban Dynamometer Driving Schedule (UDDS) followed by two New York City Cycles and concluding with another UDDS. This testing was conducted in a temperature-controlled enclosure where a temperature of 105°F (+/- 5°F) was maintained throughout the test to simulate high-temperature ambient conditions. A small tank heater, placed 3 1/4 inches below the center of the fuel tank, was utilized throughout the test as a heat source. The heater outlet air temperature was approximately 160°F.

The following results were reported by ATL:

| | <u>OEM</u> | | <u>Replacement</u> | |
|-------------------|----------------|--------------|--------------------|--------------|
| | <u>Initial</u> | <u>Final</u> | <u>Initial</u> | <u>Final</u> |
| Liquid Temp. (°F) | 105.5 | 145.3 | 104.1 | 140.2 |
| Vapor Temp. (°F) | 103.1 | 153.7 | 102.7 | 154.1 |

The test results show that the liquid fuel and vapor space temperatures in the replacement fuel tank is comparable to those in the OEM fuel tank and that the heat retention and transfer characteristics of the two tanks are similar.

These vehicles have also been certified with the OBD II leak detection monitoring system. This monitoring system is designed to detect 0.040 inches and larger diameter leaks throughout the evaporative system. Braun conducted testing using the same vehicle to ensure that the replacement fuel tank does not falsely trigger trouble codes or disable the vehicle's leak detection system. With the replacement fuel tank installed, a 0.040 inch diameter leak was introduced into the vehicle's evaporative system, in the purge line between the purge solenoid and the emission canister as well as in the gas cap. In both cases, ATL reported that the system detected the leak and a malfunction indicator light was illuminated. Using a Vetronix MasterTech scantool, ATL verified that the evaporative system small leak trouble code, P0442, was stored in the on-board computer. The leak was then removed, and the vehicle was driven on the road for approximately 50 miles. After a cold-soak, key-on, and a short on-road driving, ATL verified that all of the readiness codes had set and that no trouble codes were stored in the on-board computer. Before each of these three leak detection tests, all of the codes were cleared using the scantool.

Based on the above, staff concludes that the evaporative emissions and the OBD II leak detection system of the vehicles for which the exemption is requested will not be affected by the installation of the replacement fuel tank.